

Substitute form 1449A/PTO

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet A1 of



Complete if Known

Application Number	10/617,843
Filing Date	July 11, 2003
First Named Inventor	Saxler
Group Art Unit	2823
Examiner Name	Fernando L. Toledo
Attorney Docket Number	5308-248

## U.S. PATENTS AND PATENT PUBLICATIONS

Examiner Initials*	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code (if known)		

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T
		Office	Number	Kind Code (if known)			

## OTHER NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T
<i>FW</i>	1.	Ben-Yaacov et al., "AlGaIn/GaN Current Aperture Vertical Electron Transistors with Regrown Channels," <i>Journal of Applied Physics</i> . Vol. 95, No. 4, pp. 2073-2078 (2004).	
<i>FW</i>	2.	Burm et al. "Ultra-Low Resistive Ohmic Contacts on n-GaN Using Si Implantation," <i>Applied Physics Letters</i> . Vol. 70, No. 4, 464-66 (1997).	
<i>FW</i>	3.	Heikman, et al., "Mass Transport Regrowth of GaN for Ohmic Contacts to AlGaIn/GaN," <i>Applied Physics Letters</i> . Vol. 78, No. 19, pp. 2876	
<i>FW</i>	4.	Shen et al., "High-Power Polarization-Engineered GaN/AlGaIn/GaN HEMTs Without Surface Passivation," <i>IEEE Electronics Device Letters</i> . Vol. 25, No. 1, pp. 7-9 (2004).	
<i>FW</i>	5.	United States Patent Application entitled "Co-Doping for Fermi Level Control in Semi-Insulating Group III Nitrides," filed January 7, 2004 (Attorney Docket No. 5308-371).	
<i>FW</i>	6.	United States Patent Application entitled "Nitride Heterojunction Transistors Having Charge-Transfer Induced Energy Barriers and Methods of Fabricating the Same," Serial No. 10/772,882, filed February 5, 2004 (Attorney Docket No. 5308-389).	
<i>FW</i>	7.	United States Patent Application entitled "Semiconductor Devices Having a Hybrid Channel Layer, Current Aperture Transistors and Methods of Fabricating the Same," Serial No. 10/849,589, filed May 20, 2004 (Attorney Docket No. 5308-412).	
<i>FW</i>	8.	United States Patent Application entitled "Methods of Fabricating Nitride-Based Transistors Having Regrown Ohmic Contact Regions and Nitride-Based Transistors Having Regrown Ohmic Contact Regions," Serial No. 10/849,617, filed May 20, 2004 (Attorney Docket No. 5308-413).	
<i>FW</i>	9.	United States Patent Application entitled "Methods of Fabricating Nitride-Based Transistors with a Cap Layer and a Recessed Gate," filed July 23, 2004 (Attorney Docket No. 5308-392).	
<i>FW</i>	10.	United States Patent Application entitled "Methods of Having Laterally Grown Active Region and Methods of Fabricating Same," filed July 26, 2004 (Attorney Docket No. 5308-374).	
<i>FW</i>	11.	United States Patent Application entitled, "Silicon Carbide on Diamond Substrates and Related Devices and Methods," (Cree Docket No. P0387).	

Examiner Signature

Date Considered

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<b>FORM PTO-1449</b> U.S. Department of Commerce Patent and Trademark Office		Attorney Docket Number: 5308-248	Serial No.: 10/617,843
LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)		Applicants: Saxler et al.	
		Filing Date: July 11, 2003	Group: 2823
24.	Heikman et al., "Polarization Effects in GaN/GaN and GaN/AlGaIn/GaN heterostructures", <i>Journal of Applied Physics</i> , Vol. 93, No. 15, 2003, pp.10114-10118.		
25.	Karmalkar et al., "Enhancement of Breakdown Voltage in AlGaIn/GaN High Electron Mobility Transistors Using a Field Plate, <i>IEEE Transactions on Electron Devices</i> , Vol. 48, No. 8, August 2001		
26.	Karmalkar et al., "Resurf AlGaIn/GaN HEMT for High Voltage Power Switching", <i>IEEE Electron Device Letters</i> , Vol. 22, No. 8, August 2001, pp. 373-375.		
27.	Kuzmik et al. "Annealing of Schottky contacts deposited on dry etched AlGaIn/GaN," <i>Semiconductor Science and Technology</i> . Vol. 17, No. 11, November 2002.		
28.	Neuburger et al. "Design of GaN-based Field Effect Transistor Structures based on Doping Screening of Polarization Fields," WA 1.5, 7th Wide-Bandgap III-Nitride Workshop, March 2002.		
29.	Sriram et al. "RF Performance of AlGaIn/GaN MODFET's on High Resistivity SiC Substrates," Presentation at Materials Research Society Fall Symposium, 1997.		
30.	Sriram et al. "SiC and GaN Wide Bandgap Microwave Power Transistors," <i>IEEE Sarnoff Symposium</i> , March 18, 1998.		
31.	Wu et al., "30-W/mm AlGaIn/GaN HEMTs by Field Plate Optimization", <i>IEEE Electron Device Letters</i> , Published 2004.		

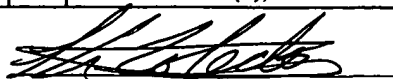
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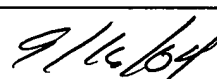
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U. S. PATENT DOCUMENTS							
Examiner Initial	No.	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
<i>Pat</i>	1.	6,586,781 B2	7/1/03	Wu et al.	257	194	
<i>Pat</i>	2.	6,548,333 B2	4/15/03	Smith	438	172	
<i>Pat</i>	3.	6,515,316 B1	2/4/03	Wojtowicz	257	194	
<i>Pat</i>	4.	6,448,648 B1	9/10/02	Boos	257	751	
<i>Pat</i>	5.	6,429,467 B1	8/6/02	Ando	257	194	
<i>Pat</i>	6.	6,046,464	4/4/00	Schetzina	257	96	
<i>Pat</i>	7.	6,028,328	2/22/00	Riechert et al.	257	194	
<i>Pat</i>	8.	5,172,197	12/15/92	Nguyen et al.	357	22	
<i>Pat</i>	9.	5,053,348	10/1/91	Mishra et al.	437	41	
<i>Pat</i>	10.	4,946,547	8/7/90	Palmour et al.	156	643	
<i>Pat</i>	11.	2004/0029330 A1	2/12/04	Hussain et al.	438	172	
<i>Pat</i>	12.	2004/0021152 A1	2/5/04	Nguyen et al.	257	192	
<i>Pat</i>	13.	2003/0102482 A1	6/5/03	Saxler	257	85	
<i>Pat</i>	14.	2003/0020092 A1	1/30/03	Parikh et al.	257	192	
<i>Pat</i>	15.	2002/0167023 A1	11/14/02	Chavarkar et al.	257	194	
<i>Pat</i>	16.	2001/0023964 A1	09/27/01	Wu et al.	257	368	
<i>Pat</i>	17.	2001/0020700 A1	09/13/01	Inoue et al.	257	20	
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes   No
<i>Pat</i>	18.	WO 93/23877	11/25/93	PCT	H01L	29/10	
<i>Pat</i>	19.	10-050982	2/20/98	JP	H01L	29/778	
<i>Pat</i>	20.	0 563 847 A2	10/6/93	EP	H01L	29/812	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
<i>Pat</i>	21.	Breitschadel et al., "Minimization of Leakage Current of Recessed Gate AlGaIn/GaN HEMTs by Optimizing the Dry-Etching Process", Journal of Electronic Materials, Volume 28, No. 12, 1999.					
<i>Pat</i>	22.	Burm et al., "Recessed Gate GaN MODFETS", Solid State Electronics, Volume 41, No. 2, pp. 247-250, 1997					
<i>Pat</i>	23.	Chen et al., "Reactive ion etching for gate recessing of AlGaIn/GaN Field-effect transistors", J. Vac. Sci. Technol. B 17(6), Nov/Dec 1999					

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<b>Applicants: Adam William Saxler et al.</b>							
<b>Filing Date: July 11, 2003</b>						<b>Group 2811</b>	
<b>U. S. PATENTS &amp; PATENT APPLICATION PUBLICATIONS</b>							
Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate	
<i>FW</i>	1.	4,424,525	1/3/84	Mimura	357	23	
<i>FW</i>	2.	4,471,366	9/11/84	Delagebeaudeuf et a.	357	16	
<i>FW</i>	3.	4,727,403	2/23/88	Hilda et al.	357	22	
<i>FW</i>	4.	4,788,156	11/98	Stoneham et al.	438	167	
<i>FW</i>	5.	5,946,547	8/7/90	Palmour et al.	156	643	
<i>FW</i>	6.	5,192,987	3/9/93	Khan et al.	257	183.1	
<i>FW</i>	7.	5,200,022	4/6/93	Kong et al.	156	612	
<i>FW</i>	8.	5,210,051	5/11/93	Carter, Jr.	437	107	
<i>FW</i>	9.	5,292,501	3/8/94	Degenhardt et al.	424	49	
<i>FW</i>	10.	5,296,395	3/22/94	Khan et al.	437	40	
<i>FW</i>	11.	Re. 35,861	2/14/95	Davis et al.	437	100	
<i>FW</i>	12.	5,393,993	2/28/95	Edmond et al.	257	77	
<i>FW</i>	13.	5,523,589	6/4/96	Edmond et al.	257	77	
<i>FW</i>	14.	5,701,019	12/23/97	Matsumoto et al.	257	192	
<i>FW</i>	15.	5,705,827	1/6/98	Baba et al.	257	46	
<i>FW</i>	16.	5,885,860	3/99	Weitzel et al.	438	179	
<i>FW</i>	17.	6,064,082	5/16/00	Kawai et al.	257	192	
<i>FW</i>	18.	6,177,685	1/23/01	Teraguchi et al.	257	20	
<i>FW</i>	19.	6,218,680	4/17/01	Carter, Jr. et al.	257	77	
<i>FW</i>	20.	6,639,255	10/03	Inoue et al.	257	194	
<i>FW</i>	21.	2001/0015446	8/23/01	Inoue et al.	257	192	
<b>FOREIGN PATENT DOCUMENTS</b>							
Document Number	Date	Country	Class	Subclass	Translation Yes   No		
<i>FW</i>	22.	JP02002016087	1/18/02	Japan			
<i>FW</i>	23.	JP02001230407	8/24/01	Japan			

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24.	WO03/049193	6/12/03	PCT				
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
25.	Chu et al., "GaN materials for high power microwave amplifiers," Mat Res. Soc. Symp. Proc., Vol. 512 (1998)						
26.	Eastman et al., "Undoped AlGaIn/GaN HEMTs for Microwave Power Amplification," <i>IEEE Transactions on Electron Devices</i> , Vol. 48, No. 3, March 2001, p. 479-85.						
27.	G. Sullivan et al., "High Power 10-GHz Operation of AlGaIn HFETs in Insulating SiC," <i>IEEE Electron Device Letters</i> , Vol. 19, No. 6, p. 198, June 1998						
28.	Gaska et al., "Electron transport in AlGaIn-GaN heterostructures grown on GH-SiC substrates," <i>Applied Physics Letters</i> , Vol. 72, No. 6, February 9, 1998, pp. 707-709						
29.	Gaska et al., "High-Temperature Performance of AlGaIn/GaN HFETs on SiC Substrates," <i>IEEE Electron Device Letters</i> , Vol. 18, No. 1, p. 492, October 1997						
30.	Gelmont et al., "Monte Carlo simulation of electron transport in gallium nitride," <i>J. Appl. Phys.</i> , Vol. 74, No. 3, August 1, 1993, pp. 1818-1821						
31.	Heikman et al., "Growth of Fe doped semi-insulating GaN by metalorganic chemical vapor deposition," <i>Applied Physics Letters</i> , Vol. 81, No. 3, July 15, 2002, pp. 439-441						
32.	International Search Report, PCT/US02/09398, August 20, 2002						
33.	P.M. Asbeck et al., "Piezoelectric charge densities in AlGaIn/GaN HFETs," <i>Electronics Letters</i> , Vol. 33, No. 14, pp. 1230-1231, 1997						
34.	Ping et al., "DC and Microwave Performance of High-Current AlGaIn/GaN Heterostructure Field Effect Transistors Grown on P-Type SiC Substrates," <i>IEEE Electron Letters</i> , Vol. 19, No. 2, p. 54, February 1998						
35.	Sheppard et al., "Improved 10-GHz Operation of GaN/AlGaIn HEMTs on Silicon Carbide," <i>Materials Science Forum</i> , Vols. 338-342, pp. 1643-6. (2000)						
36.	Sheppard et al., "High Power Demonstration at 10 GHz with GaN/AlGaIn HEMT Hybrid Amplifiers." Presented at the 58 <sup>th</sup> DRC, Denver, CO June 2000.						
37.	Sheppard et al., U.S. Patent Application Serial No. 09/096,967 entitled, <i>Nitride Based Transistors on Semi-Insulating Silicon Carbide Substrates</i> , filed June 12, 1998.						
38.	Wu et al., "High Al-Content AlGaIn/GaN MODFET's for Ultrahigh Performance," <i>IEEE Electron Device Letters</i> , Vol. 19, No. 2, p. 50, February 1998						

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*L. Stebbins*

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